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Please find below and/or attached an Office communication concerning this application or proceeding.

DETAILED ACTION

1. This Office Action is in response to the amendment filed 18 November 2005.
2. Claims 1, 3-23, 25-36, 40, 41 and 46-51 were amended.
3. Claims 1-51 are pending in this Office Action.

Response to Amendment

4. The objection to the specification regarding minor informalities was addressed and is withdrawn.
5. The objection to the claims regarding minor informalities was addressed and is withdrawn.
6. The rejection of claims 1-35 under 35 U.S.C. § 101 regarding non-statutory subject matter was addressed and is withdrawn.
7. The rejection is respectfully maintained as set forth in the last Office Action mailed on 18 November 2005. Applicant's arguments with respect to claims 1-51 have been fully considered but they are not persuasive and the old rejection maintained.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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9. Claims 1-5, 7-20, and 24-51 are rejected under 35 U.S.C. 102(b) as being anticipated by Gehani et al. (U.S. 5,765,171).

10. With respect to claim 1, Gehani teaches a computer-based system for replicating data over a network, comprising:

A master server containing an original copy of the data, the master server comprising: a master user layer to start a data replication process by calling a start method, the master user layer further adapted to send information relating to the original copy of the data; a master service layer containing the start method to receive the call from the master user layer and the information relating to the original copy of the data, the master service layer and to create and send a data replication packet containing at least some of the information relating to the original copy of the data (Gehani, col. 7, lines 44-46); a slave server to store a copy of the data from the master server, the slave server comprising: a slave service layer to receive the data replication packet from the master service layer and process the data replication packet, and to send information relating to the data replication packet; and a slave user layer to receive the information relating to the data replication packet from the slave service layer, and to store the information in the data replication packet (Gehani, col. 7, lines 46-60).

11. With respect to claim 2, Gehani teaches the invention the invention described in claim 1, including a system where the master user layer is in communication with at least one of a master user and a master user device (Gehani, col. 4, lines 28-33).

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12. With respect to claim 3, Gehani teaches the invention the invention described in claim 1, including a system where the master user layer sends information relating to the original copy of the data in the form of a delta, the delta containing information relating to changes between a previous state and the current state of the original copy of the data (Gehani, col. 7, lines 44-46).
13. With respect to claim 4, Gehani teaches the invention the invention described in claim 1, including a system where the master user layer updates the original copy of the data (Gehani, col. 7, lines 15-17).
14. With respect to claim 5, Gehani teaches the invention the invention described in claim 1, including a system where the master user layer sends a roll-back message indicating that a change to the original copy of the data should not be replicated on a slave server (Gehani, col. 7, lines 44-57).
15. With respect to claim 7, Gehani teaches the invention the invention described in claim 1, including a system where the master user layer creates a delta between the present state of the original copy of the data and the prior state of the original copy of the data (Gehani, Fig. 3; col. 5, lines 37-46).
16. With respect to claim 8, Gehani teaches the invention the invention described in claim 1, including a system where the master user layer creates a delta between the present state of the

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original copy of the data and a previous state of the original copy of the data (Gehani, Fig. 3; col. 5, lines 37-46).

17. With respect to claim 9, Gehani teaches the invention the invention described in claim 1, including a system where the master user layer generates a unique version number for each state of the original copy of the data (Gehani, col. 5, lines 60-62).

18. With respect to claim 10, Gehani teaches the invention the invention described in claim 1, including a system where the master service layer multicasts the data replication packet (Gehani, col. 7, lines 3-5).

19. With respect to claim 11, Gehani teaches the invention the invention described in claim 1, including a system where the master service layer heartbeats the data replication packet (Gehani, col. 7, lines 3-17).

20. With respect to claim 12, Gehani teaches the invention the invention described in claim 1, including a system where the master service layer includes a version number in the data replication packet (Gehani, col. 7, lines 44-46).

21. With respect to claim 13, Gehani teaches the invention the invention described in claim 1, including a system where the master service layer includes information necessary to update

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the copy of the data on the slave server to the current state of the original copy of the data (Gehani, col. 7, lines 44-60).

22. With respect to claim 14, Gehani teaches the invention the invention described in claim 1, including a system where the master service layer creates and send a data replication packet comprising a delta (Gehani, col. 7, lines 44-60).

23. With respect to claim 15, Gehani teaches the invention the invention described in claim 1, including a system where the master service layer creates and sends a data replication packet comprising a delta between successive states of the original copy of the data (Gehani, Fig. 6; col. 8, lines 32-58).

24. With respect to claim 16, Gehani teaches the invention the invention described in claim 1, including a system where the master service layer creates and sends a data replication packet comprising a delta between arbitrary states of the original copy of the data (Gehani, col. 7, lines 44-46).

25. With respect to claim 17, Gehani teaches the invention the invention described in claim 1, including a system where the master service layer requests a delta from the master user layer (Gehani, col. 7, lines 44-46).

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26. With respect to claim 18, Gehani teaches the invention the invention described in claim 1, including a system where the master service layer sends a commit message to a slave service layer (Gehani, col. 7, lines 44-46).

27. With respect to claim 19, Gehani teaches the invention the invention described in claim 1, including a system where the master service layer heartbeats a commit message to a slave service layer (Gehani, col. 7, lines 3-17).

28. With respect to claim 20, Gehani teaches the invention the invention described in claim 1, including a system where the master service layer multicasts a commit message to a slave service layer (Gehani, col. 7, lines 3-5).

29. With respect to claim 24, Gehani teaches the invention the invention described in claim 1, including a system where the slave user layer is in communication with at least one of a slave user and a slave user device (Gehani, col. 4, lines 14-27).

30. With respect to claim 25, Gehani teaches the invention the invention described in claim 1, including a system where the slave user layer checks the current version number of data stored on the slave server (Gehani, col. 7, lines 46-60).

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31. With respect to claim 26, Gehani teaches a system where the slave user layer commits information relating to the data replication packet to the data stored on the slave server (Gehani, col. 7, lines 46-60).

32. With respect to claim 27, Gehani teaches the invention the invention described in claim 1, including a system where the slave user layer aborts an update to the data stored on the slave server (Gehani, col. 7, lines 46-60).

33. With respect to claim 28, Gehani teaches the invention the invention described in claim 1, including a system where the slave user layer processes a prepare request contained in the data replication packet (Gehani, col. 7, lines 46-60).

34. With respect to claim 29, Gehani teaches the invention the invention described in claim 1, including a system where the slave user layer sends a response to the slave service layer relating to a prepare request contained in the data replication packet (Gehani, col. 7, lines 46-60).

35. With respect to claim 30, Gehani teaches the invention the invention described in claim 1, including a system where the slave user layer persistently caches data on a local disk (Gehani, col. 7, lines 46-60).

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36. With respect to claim 31, Gehani teaches the invention the invention described in claim 1, including a system where the slave user layer updates the version number of the copy of the data on the slave server (Gehani, col. 7, lines 46-60).
37. With respect to claim 32, Gehani teaches the invention the invention described in claim 1, including a system where the slave service layer requests a delta from the master service layer (Gehani, col. 4, lines 41-45).
38. With respect to claim 33, Gehani teaches the invention the invention described in claim 1, including a system where the slave service layer requests the current version number of the data stored on the slave server from the slave user layer (Gehani, col. 7, lines 46-60).
39. With respect to claim 34, Gehani teaches the invention the invention described in claim 1, including a system where the slave service layer sends a commit message to the slave user layer (Gehani, col. 7, lines 44-46).
40. With respect to claim 35, Gehani teaches the invention the invention described in claim 1, including a system where the slave service layer sends an abort message to the slave user layer (Gehani, col. 7, lines 54-57).
41. With respect to claim 36, Gehani teaches a computer-based method for replicating data from a master server to a slave server, comprising:

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Sending a start call from a master user level to a master service level on a master server, the start call containing information relating to the current state of master data on the master server; sending the information to a slave service layer on a slave server (Gehani, col. 7, lines 44-46), the slave service layer adapted to check a slave user layer on the slave server to determine whether slave data on the slave server has the current state (Gehani, col. 7, lines 46-48); sending a request for a delta from the slave service layer to the master service layer, the master service layer adapted to request and receive a delta from the master user layer (Gehani, col. 4, lines 41-45); sending a delta from the master service layer to the slave service layer, the delta containing the information necessary to bring the slave data up to the current state, the slave service layer adapted to process the delta and send the information to the slave user layer ; and updating the slave data using the slave user layer (Gehani, col. 7, lines 46-60).

42. With respect to claim 37, Gehani teaches the invention the invention described in claim 36, including a method further comprising: determining a version number for the current state of the data using the master user layer (Gehani, col. 7, lines 44-46).

43. With respect to claim 38, Gehani teaches the invention the invention described in claim 36, including a method further comprising: sending the information to the slave service layer by multicasting (Gehani, col. 7, lines 3-5).

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44. With respect to claim 39, Gehani teaches the invention the invention described in claim 36, including a method further comprising: sending information to the slave service layer, the information comprising a version number for the current state of the master data (Gehani, col. 7, lines 44-46).

45. With respect to claim 40, Gehani teaches a computer-based method for replicating data from a master server to a slave server, comprising:

Sending a new delta from a master user level to a master service level on a master server, the delta containing information relating to a change from the prior state to the current state in master data stored on the master server; sending the new delta from the master service layer to a slave service layer on a slave server (Gehani, col. 7, lines 44-46), the slave service layer adapted to check a slave user layer on the slave server to determine whether the slave data on the slave server has the current state (Gehani, col. 7, lines 46-48); sending a request for a syncing delta from the slave service layer to the master service layer (Gehani, col. 4, lines 41-45), the master service layer adapted to request and receive a syncing delta from the master user layer, the syncing delta containing information necessary to update the slave data to the prior state of the master data; sending the syncing delta from the master service layer to the slave service layer, the slave service layer adapted to process the delta and send the information to the slave user layer to be committed to the slave data; and committing the information in the new delta to the slave data using the slave user layer (Gehani, col. 7, lines 46-60).

46. With respect to claim 41, Gehani teaches a computer-based method for replicating data from a master server to a slave server over a network, the method comprising the steps of:

Sending a version number from a master service layer to a slave service layer relating to the present state of the original copy of the data on the master server (Gehani, col. 7, lines 44-46); allowing a slave user layer to determine whether the data on the slave server has been updated to correspond to the version number (Gehani, col. 7, lines 46-48); and requesting a delta be sent from the master service layer to the slave service layer if the data on the slave server does not correspond to the version number (Gehani, col. 7, lines 46-60).

47. With respect to claim 42, Gehani teaches a method according to claim 36, further comprising: allowing the slave user layer to persistently cache the data on a local disk for each slave server (Gehani, col. 7, lines 46-60).

48. With respect to claim 43, Gehani teaches a method according to claim 36, further comprising: allowing the master user layer to determine a unique version number for the current state of the data on the master server (Gehani, col. 5, lines 60-62).

49. With respect to claim 44, Gehani teaches a method according to claim 36, further comprising: including data with the version number that is necessary for a slave user layer to update the data on a slave server (Gehani, col. 7, lines 44-46).

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50. With respect to claim 45, Gehani teaches a method according to claim 36, further comprising: committing the data necessary to update the slave server as soon as it is received by the slave user layer (Gehani, col. 7, lines 44-46).

51. With respect to claim 46, Gehani teaches a computer-based method for replicating data over a network including a master server and at least one slave server, the method comprising the steps of:

Sending a packet of information from a master service layer to a slave service layer on each slave server on the network, the information relating to a change in the data stored on the master server and containing a prior version number for the prior state and a new version number for the new state of the data, the information further relating to previous changes in the data and a previous version number for each previous change (Gehani, col. 7, lines 44-46); allowing a slave user layer on each slave server to determine whether the data on the slave server corresponds to the prior version number contained in the packet (Gehani, col. 7, lines 46-48); allowing each slave user layer to commit the packet of information if the data on the slave server corresponds to the prior version number contained in the packet, the commit also updating the version of the slave server to the new version number; and allowing each slave user layer not corresponding to the prior version number to request that a delta be sent from the master service layer to the slave service layer corresponding to that slave user layer, the delta containing the information necessary to update the slave to the prior version number before the slave service layer commits the packet of information (Gehani, col. 7, lines 46-60).

52. With respect to claim 47, Gehani teaches a computer-based method for replicating data from a master server to at least one slave server over a network, the method comprising the steps of:

Sending a packet of information from a master service layer on the master server to the user service layer on a slave server, the information relating to a change in the data stored on the master server and containing a version number for the present state of the data (Gehani, col. 7, lines 44-46); allowing the slave user layer on the server to determine whether the slave server has been updated to correspond to the version number contained in the packet, and to further determine whether the slave user layer can process the packet of information if needed to update to correspond to the version number contained in the packet (Gehani, col. 7, lines 46-48); sending a signal from the slave service layer to the master service layer, the signal indicating whether the slave server needs to be updated and whether the slave server can process the update (Gehani, col. 4, lines 41-45); sending a response signal from the master service layer to the slave service layer indicating whether the slave user layer should commit to the information contained in the packet; and committing the packet of information to the slave server if so indicated by the response signal (Gehani, col. 7, lines 46-60).

53. With respect to claim 48, Gehani teaches a computer-readable medium, comprising: means for sending a version number from a master service layer to a slave service layer relating to the present state of the original copy of the data on the master server (Gehani, col. 7, lines 44-46); means for allowing a slave user layer to determine whether the data on the slave server has been updated to correspond to the version number (Gehani, col. 7, lines 46-

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48); and means for requesting a delta be sent from the master service layer to the slave service layer if the data on the slave server does not correspond to the version number (Gehani, col. 4, lines 41-45).

54. With respect to claim 49, Gehani teaches a computer program product for execution by a server computer for replicating data from a master server to a slave server over a network, comprising:

Computer code for sending a version number from a master service layer to a slave service layer relating to the present state of the original copy of the data on the master server (Gehani, col. 7, lines 44-46); computer code for allowing a slave user layer to determine whether the data on the slave server has been updated to correspond to the version number (Gehani, col. 7, lines 46-48); and computer code for requesting a delta be sent from the master service layer to the slave service layer if the data on the slave server does not correspond to the version number (Gehani, col. 4, lines 41-45).

55. With respect to claim 50, Gehani teaches a s computer-based system for replicating data over a network, comprising:

Means for sending a version number from a master service layer to a slave service layer relating to the present state of the original copy of the data on the master server (Gehani, col. 7, lines 44-46); means for allowing a slave user layer to determine whether the data on the slave server has been updated to correspond to the version number (Gehani, col. 7, lines 46-48); and means for requesting a delta be sent from the master service layer to the slave

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service layer if the data on the slave server does not correspond to the version number (Gehani, col. 4, lines 41-45).

56. With respect to claim 51, Gehani teaches a computer system comprising:

A processor; object code executed by the processor, the object code configured to: send a version number from a master service layer to a slave service layer relating to the present state of the original copy of the data on the master server (Gehani, col. 7, lines 44-46); allow a slave user layer to determine whether the data on the slave server has been updated to correspond to the version number (Gehani, col. 7, lines 46-48); and request a delta be sent from the master service layer to the slave service layer if the data on the slave server does not correspond to the version number (Gehani, col. 4, lines 41-45).

Claim Rejections - 35 USC § 103

57. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

58. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gehani and further in view of Mosher et al. (U.S. 6,785,696).

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Gehani teaches the invention substantially as claimed including a replication protocol which includes associating a database version vector with each copy of the database in the system, the database version vectors of the replicas are compared to efficiently determine if update replication is necessary.

59. With respect to claim 6, Gehani teaches the invention described in claim 1, including a master server containing an original copy of the data, the master server comprising: a master user layer adapted to start a data replication process by calling a start method, the master user layer further adapted to send information relating to the original copy of the data; a master service layer containing the start method and adapted to receive the call from the master user layer and the information relating to the original copy of the data, the master service layer further adapted to create and send a data replication packet containing at least some of the information relating to the original copy of the data (Gehani, col. 7, lines 44-46).

Gehani does not explicitly teach the use of a timeout value for replication.

However, Mosher teaches a system where the master user layer is adapted to set a timeout value for the replication (Mosher, Fig. 5B; col. 7, lines 4-10).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Gehani in view of Mosher in order to enable the use of a timeout value for replication. One would be motivated to do so in order to allow for a proper synchronization of the database files.

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60. Claims 21-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gehani and further in view of Fiske (U.S. 6,324,692).

Gehani teaches the invention substantially as claimed including a replication protocol which includes associating a database version vector with each copy of the database in the system, the database version vectors of the replicas are compared to efficiently determine if update replication is necessary.

61. With respect to claim 21, Gehani teaches the invention described in claim 1, including a master server containing an original copy of the data, the master server comprising: a master user layer adapted to start a data replication process by calling a start method, the master user layer further adapted to send information relating to the original copy of the data; a master service layer containing the start method and adapted to receive the call from the master user layer and the information relating to the original copy of the data, the master service layer further adapted to create and send a data replication packet containing at least some of the information relating to the original copy of the data (Gehani, col. 7, lines 44-46).

Gehani does not explicitly teach the master server sending the slave server an abort message.

However, Fiske teaches a system where the master service layer is adapted to send an abort message to a slave service layer (Fiske, col. 5, lines 37-42).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Gehani in view of Fiske in order to enable the master server sending the

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slave server an abort message. One would be motivated to do so in order to allow for the master server to correct potential mistakes encountered during replication.

62. With respect to claim 22, Gehani teaches the invention described in claim 1, including a system where the master service layer is adapted to heartbeat the data replication packet (Gehani, col. 7, lines 3-17).

Gehani does not explicitly teach the master server sending the slave server an abort message.

However, Fiske teaches a system where the master service layer is adapted to send an abort message to a slave service layer (Fiske, col. 5, lines 37-42).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Gehani in view of Fiske in order to enable the master server sending the slave server an abort message. One would be motivated to do so in order to allow for the master server to correct potential mistakes encountered during replication.

63. With respect to claim 23, Gehani teaches the invention described in claim 1, including a system where the master service layer is adapted to multicast the data replication packet (Gehani, col. 7, lines 3-5).

Gehani does not explicitly teach the master server sending the slave server an abort message.

However, Fiske teaches a system where the master service layer is adapted to send an abort message to a slave service layer (Fiske, col. 5, lines 37-42).

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It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Gehani in view of Fiske in order to enable the master server sending the slave server an abort message. One would be motivated to do so in order to allow for the master server to correct potential mistakes encountered during replication.

Response to Arguments

64. Applicant's arguments filed 18 November 2005 have been fully considered, but they are not persuasive for the reasons set forth below.

65. *Applicant Argues:* As to claims 1, 36, 40, 41 and 46-51 Applicant states "Gehani does not describe a system with a master user layer, master service layer, slave service layer and slave user layer. The use of two layers at each side allows for abstraction of the services."

In Response: The examiner respectfully submits that Gehani teaches a system with a master user layer (the clients at the various sites provide users with an interface to communicate with servers to read and update data items – see Gehani, col. 4, lines 39-41 and one or more clients may be located on the server – see Gehani, col. 4, lines 27-28), master service layer (when updates are made on a server, these updates are propagated to other servers during a replication session – see Gehani, col. 4, lines 42-44), slave service layer (an update refers to modification of one or more data items at the request of the client – see Gehani, col. 4, lines 41-42) and slave user layer (the clients at the various sites provide users with an interface to communicate with servers to read and update data items – see Gehani, col. 4, lines 39-41). According to the specification, Applicant states "the user layer can correspond the user of the data replication system" (page 9, lines 7-8) and a system (or DRS layer) can correspond to the implementation of the data replication system itself (page 9, lines 7-9). This renders the rejection proper, and thus rejection stands.

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Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alicia Baturay whose telephone number is (571) 272-3981. The examiner can normally be reached at 7:30am - 5pm, Monday - Thursday, and every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Saleh Najjar can be reached on (571) 272-4006. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

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Alicia Baturay
January 20, 2006


SALEH NAJJAR
SUPERVISORY PATENT EXAMINER